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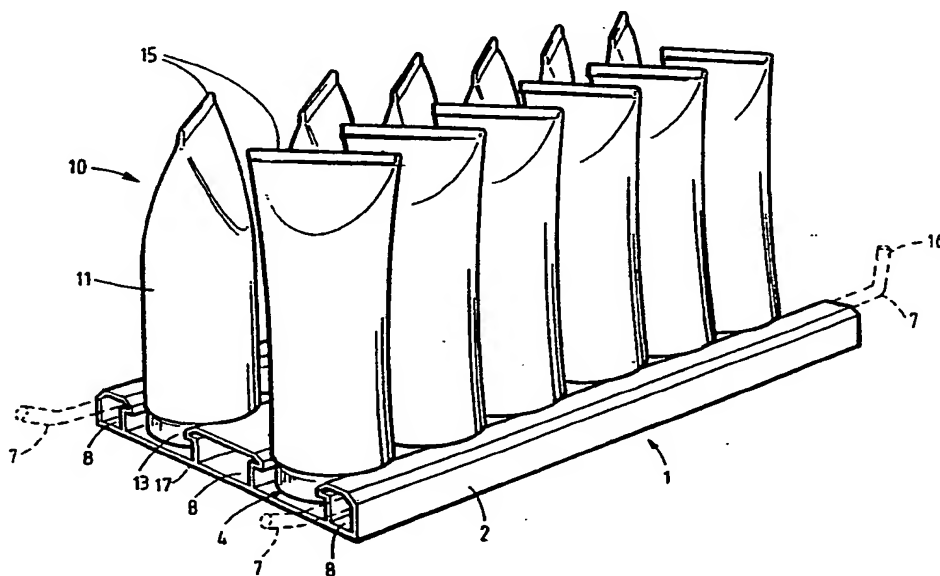
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<b>(21) International Application Number:</b> PCT/SE92/00420 <b>(22) International Filing Date:</b> 15 June 1992 (15.06.92)  <b>(30) Priority data:</b> 9102213-7 22 July 1991 (22.07.91) SE  <b>(71) Applicant (for all designated States except US):</b> NORDEN PAC DEVELOPMENT AB [SE/SE]; Box 845, S-391 28 Kalmar (SE).  <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only) :</b> LINNER, Hans [SE/SE]; Jutnabbevägen 15, S-392 36 Kalmar (SE).  <b>(74) Agents:</b> GRAUDUMS, Valdis et al.; Box 142, S-401 22 Göteborg (SE).		<b>(81) Designated States:</b> CA, DE, GB, JP, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE).  <b>Published</b> <i>With international search report.</i> <i>In English translation (filed in Swedish).</i>

**(54) Title:** TRAY FOR USE IN TRANSPORTATION AND VENDING OF CONTAINERS



**(57) Abstract**

A tray (1) for use in transportation and vending of containers (10) such as tubes, bottles or cans, the tray comprising gripping means (3) for resilient engagement with a defined grip region (14) on said containers (10) for retaining the containers on the tray (1). The invention is particularly characterized in that the gripping means (3) are made from an elastic material for resilient engagement with said defined grip region. The invention is further characterized in that the tray (1) presents suspending means (5) intended for cooperation with pre-existing suspension rods (7). In a preferred embodiment the tray (1) is made from an elongated section element (2) and said suspending means (5) consist of longitudinally extending channels (8) formed in the section element (2).

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TITLE: Tray for use in transportation and vending of containers

TECHNICAL FIELD:

The present invention relates to a tray for use in transportation and vending of containers such as tubes, bottles or cans.

BACKGROUND OF THE INVENTION:

Tubes of various types and with various contents have traditionally been packed in small, individual packages which are intended to contain just the tube itself. A classic example of this is toothpaste tubes. With the aid of the packages, the tubes can be lengthways stacked on top of each other on the shop shelves. The packages are also printed with advertising text, trademarks, etc. Tubes can also be distributed without individual packages, e.g. in various types of multipacks. A typical example of such a multipack is a simple tray made from stiff cardboard on which the tubes stand vertically on their caps. Even these trays are intended to be placed on shop shelves and are often delivered to the shops by covering the tray and tubes with a shrink film which is normally removed at the shop when the tubes are to be sold. A further development of this basic tray is provided with a flat upper region with holes for the screw caps of the tubes. In this manner the tubes are better located on the tray than with a completely open tray.

TECHNICAL PROBLEM:

As mentioned above, even nowadays it is very common that tubes, for instance toothpaste tubes, are sold in shops prepacked in small individual packages. In practice this implies a totally unnecessary "additional package" since the tube itself serves as a completely satisfactory package for the product. In addition, this superfluous package is in virtually all cases removed by the consumer before the product is used. This merely adds to the already grave problem of rubbish disposal. The

continued existence of such packages can be said to be a remnant from early goods handling days. Even so, the great majority of production machines for tube-filling are delivered with a packaging machine as the final work station on the production line. Clearly, the packaging machine also implies unnecessary material and energy consumption, particularly when it is taken into consideration that both the tube and the package are provided with product advertising printing of various types.

An additional problem with both individual cardboard packages and larger multipacks is that they require large shelf space in the shops. Accordingly, known display methods and trays for tubes can only be used in combination with actual shelves, and cannot therefore be used in combination with so-called suspension rods which are becoming evermore common for hanging up or suspending so-called "blisterpack" types of packaging. These types of packaging can be suspended from the outwardly projecting suspension rods by means of holes provided in the packaging. Not only are such suspension rods space-efficient, they also impart a more orderly impression on the consumer, even when some of the packages have been removed from the suspension rods. In contrast, present display means soon convey a less attractive impression on the shelves when a few tubes, bottles or cans have been removed therefrom, since this removal is often conducted in a less than careful manner. The next consumer is thus given an impression of disarray on the shelves, with reduced sales as a consequence.

These problems are not restricted to just tubes, but are applicable to virtually all types of bottles and cans which also require large shelf space.

Furthermore, in the prior art there is no effective way to transport said goods from the factory to the shop. The small individual packages create problems in terms of effectively handling a large number of them. In terms of the multipacks, normally in the form of trays, these often provide poor

location of the goods both during transportation when the tray and goods are covered by shrink film, and when on sale in the shop.

#### SUMMARY OF THE INVENTION:

It is an object of the present invention to overcome the above mentioned problems by providing a tray for use in transportation and vending of containers such as tubes, bottles or cans, which is intended to be used both on shelving and with pre-existing suspension rods in shops. A further object of the invention is that the tray is capable of retaining the goods in a safe and reliable manner.

In order to achieve these objects, the present invention provides a tray for use in transportation and vending of containers such as tubes, bottles or cans, comprising gripping means for resilient engagement with a defined grip region on said containers for retaining the containers on the tray. The invention is particularly characterized in that the gripping means are made from an elastic material for resilient engagement with said defined grip region. The tray further presents suspending means intended for cooperation with pre-existing suspension rods.

In a preferred embodiment the tray is made from an elongated section element and said suspending means consist of longitudinally extending channels formed in the section element.

The tray is furthermore advantageously formed such that adjacent opposed gripping means define at least one longitudinally extending slot adapted for row-wise insertion of the containers. The distance between the bottom surface of the longitudinally extending slot and the surface of the gripping means facing the bottom surface is advantageously adapted to provide a retaining force between the tray and the containers.

A preferred embodiment of the invention is adapted to accommodate tubes which have a tube body, a tube cap and a recess therebetween, wherein the grip region of the tube comprises the recess between the tube body and the tube cap.

A further embodiment of the invention is adapted to accommodate bottles which have a circumferentially extending shoulder at the top or bottom of the bottle, wherein the grip region of the bottle comprises said circumferentially extending shoulder.

Finally, in an embodiment adapted to accommodate bottles which have a circumferential, outwardly extending flange at the top or bottom of the bottle, the invention is particularly characterized in that the grip region of the bottle comprises said circumferential, outwardly extending flange.

#### BRIEF DESCRIPTION OF THE DRAWINGS:

The invention will be described in greater detail in the following by way of example only and with reference to the attached drawings in which

- Fig. 1 shows a perspective view of a tray according to one embodiment of the invention;
- Fig. 2 shows a cross-sectional view of the tray in Fig.1 and in which tubes have been illustrated in a retained position;
- Fig. 3 shows a perspective view of a tray according to the embodiment shown in Fig. 1 and provided with several containers;
- Fig. 4 shows a cross-sectional view of another alternative embodiment of the invention, intended for retaining bottles having a circumferentially extending shoulder, and

Fig. 5 is a cross-sectional view of an alternative tray according to the invention, intended for retaining bottles having a circumferential, outwardly extending flange.

BEST MODE OF CARRYING OUT THE INVENTION:

In Fig. 1, reference numeral 1 generally denotes a tray for transportation and vending of containers. In the shown embodiment the tray is primarily intended for retaining tubes 11 which, as best seen from Fig. 2, present a tube body 12 a tube cap 13 and a recess 16 located therebetween.

From Fig. 1 it can be seen that the tray is made from an elongated section element 2 which is advantageously produced in an extrusion process. The tray 1 is preferably made out of a suitably elastic, resilient and recyclable plastic material such as polyethylene, polypropylene or polyvinylchloride (PVC). Thus, the material of the tray can, after its useful life, be ground up and reused, which is very advantageous, not just from an environmental point of view, but also in terms of energy-saving. The tray, which in its entirety is comprised of the section element 2, further includes gripping means 3 for engagement with a grip region 14 on the tube 11 for retaining the tubes in the tray 1. The gripping means 3 are integrally formed in the upper section element 2 and are arranged pairwise facing each other. In this manner, each pair of opposing gripping means 3 defines a longitudinally extending slot 4 which is adapted for row-wise insertion of containers 10, in this case the tubes 11. The gripping means 3 are shaped for resilient engagement with the grip region 14 on the tubes 11, the grip region comprising the recess 16 between the tube body 12 and the tube cap 13, as shown in Fig. 2. The resilient engagement is possible due to two reasons; firstly since the gripping means 3 are made from an elastic, resilient material according to the above material choice, and secondly due to particular shaping of the section element 2. In order to further improv the tray's capability to retain the tubes 11 in the slot 4, the distance between the bottom surface 6 of the

longitudinally extending slot 4 and the surfaces 9 of the gripping means 3 facing the bottom surface 6 is adapted to provide a retaining force between the tray 1 and, in this case, the tube cap 13. In this manner a secure retention of the tubes in three dimensions is achieved.

The tray is also provided with suspending means 5 for cooperation with pre-existing suspension rods 7 in shops. Said suspending means 5 are in the form of longitudinally extending channels 8 in the section element 2. The channels 8 can be shaped in different ways for cooperation with one or more suspension rods 7. In Fig. 2 the suspension rods 7 are schematically depicted by dashed lines. In fig. 3 it is shown in perspective how a tray 1 with tubes 11 is suspended on two dashed suspension rods 7. These rods 7 are normally affixed to vertical wall sections which are provided with a number of holes for receiving the attachment ends 16 of the rods. The wall sections are not shown in the drawings. In Figs. 2 and 3 the tray 1 has been slid onto the rods 7 in an upward position, i.e. with the openings of the slots 4 facing upwards. However, if so desired the tray 1 can also be placed in a downwardly directed position, whereby the tubes 11 "hang" down from the tray 1.

With the object to save expensive shop space, the tray can be formed such that the tubes 11 can stand in the slots 4 in rows at an angle, as shown in Fig. 3. Thus, the end seals 15 of the tubes 11 adopt an angle with respect to the end seals 15 of the tubes 11 in adjacent rows. This allows the tube bodies 12 to be placed nearer to each other in such a manner that the width of the tray 1 is minimized.

During transportation to the shops, the tray 1 with the tubes 11 can be covered with shrink film in a known manner.

Thanks to its flat base 17, the tray 1 is also able to be placed on normal shelving should the shop not be equipped with suspension rods.

An alternative embodiment of the invention is shown in Fig.4 in which the tray 1 is adapted to retain bottles 20 which have a circumferentially extending shoulder 21 formed at the top 23 or bottom 24 of the bottle 20. The gripping means 29 are hereby intended to engage the grip region 14 on the bottle 20, this grip region corresponding to the circumferential shoulder (21). This embodiment too is provided with longitudinally extending channels 28 for cooperation with pre-existing suspension rods 7.

A further embodiment of the invention is shown in Fig. 5 in which the tray 1 is adapted to retain bottles 30 which have a circumferential, outwardly extending flange 31 formed at the top 33 or bottom 34 of the bottle 30. The gripping means 39 are hereby adapted to engage the grip region 14 on the bottle 30, this grip region corresponding to said circumferential, outwardly extending flange 31. As in the previous embodiments, the tray 1 is provided with longitudinally extending channels 38 for cooperation with pre-existing suspension rods 7.

As will be apparent from the above described embodiments, the invention offers a particularly space-saving alternative to present tube and bottle shelf displays. With the invention, the need for additional cardboard packaging around the tubes is also eliminated since the tubes no longer have to be laboriously stacked on the shelves. Even when a number of containers 10 have been removed from the tray 1, the remaining containers 10 are left in neat rows which gives the next consumer a favourable impression of orderliness.

The present invention is not restricted to the embodiments described above and shown in the drawings, but can be varied within the scope of the claims. For example, the tray 1 can include a greater number of parallel rows 4 than shown in the drawings. The invention can of course also be suitable for retaining other types of bottles, cans or tubes which have not been described above, provided that these also present a definable grip region 14. It will further be realized that the

tray 1 can be made from a material not mentioned in the description, but which possesses similar properties. It is to be noted that the tray 1 does not have to be made as an extruded section element 2, and instead it could also be constructed from a plurality of components. This would, however, increase production costs.

## CLAIMS:

1. A tray for use in transportation and vending of containers (10) such as tubes, bottles or cans, comprising gripping means (3) made from an elastic material for resilient engagement with a defined grip region (14) on said containers (10) for retaining the containers on the tray, characterized in that the tray (1) is made from an elongated section element (2) and presents suspending means (5) which consist of longitudinally extending channels (8) formed in the section element (2), which channels are intended for cooperation with pre-existing suspension rods (7).

2. A tray as claimed in claim 1, characterized in that adjacent opposed gripping means (3) define at least one longitudinally extending slot (4) adapted for row-wise insertion of said containers (10).

3. A tray as claimed in claim 2, characterized in that the distance between the bottom surface (6) of the longitudinally extending slot (4) and the surface (9) of the gripping means (3) facing the bottom surface (6) is adapted to provide a retaining force between the tray (1) and the containers (10).

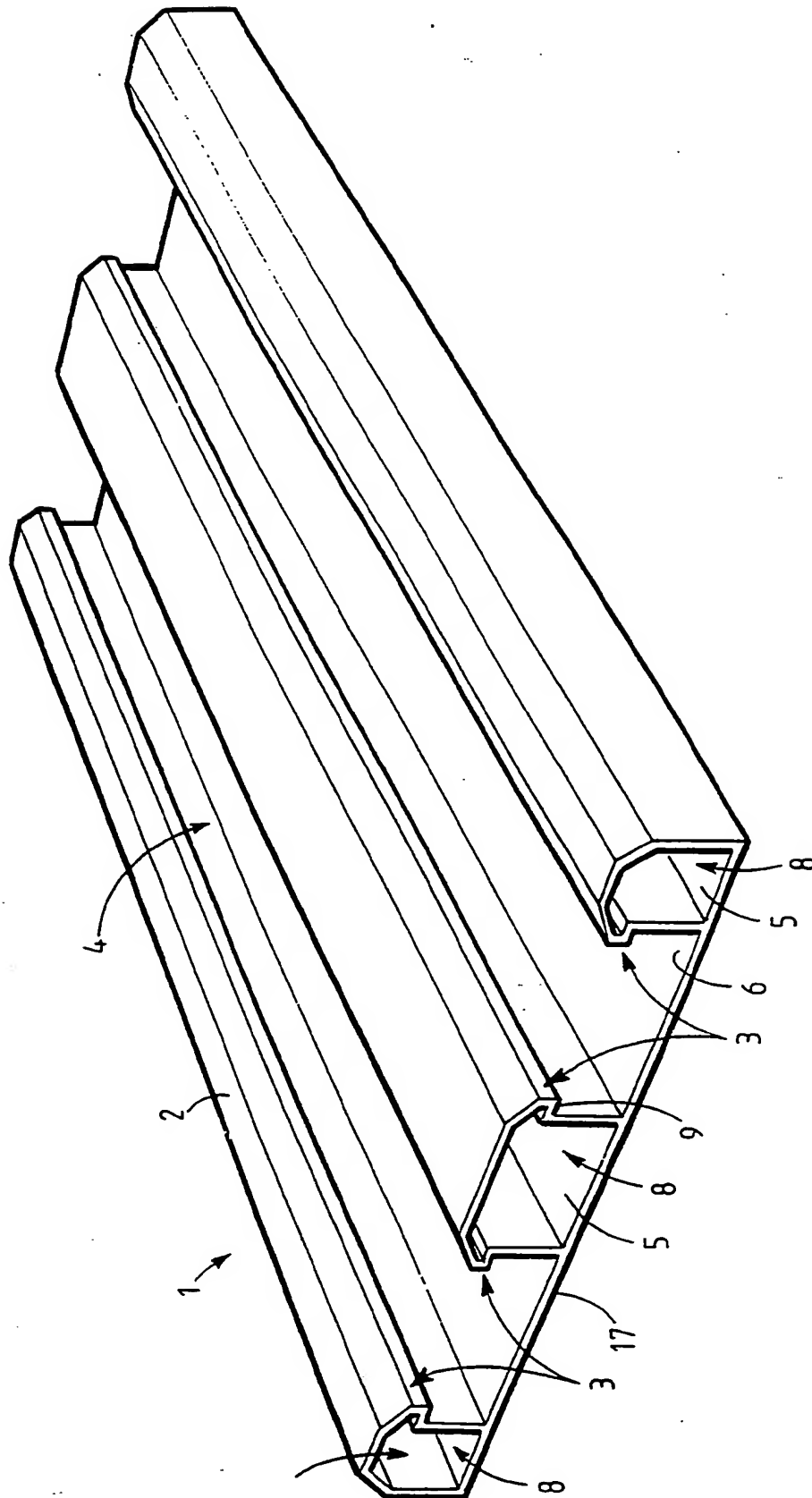
4. A tray as claimed in claim 1, adapted to accommodate tubes (11) which have a tube body (12), a tube cap (13) and a recess (16) therebetween, characterized in that the grip region (14) of the tube (11) comprises the recess (16) between the tube body (12) and the tube cap (13).

5. A tray as claimed in claim 1, adapted to accommodate bottles (20) which have a circumferentially extending shoulder (21) at the top (23) or bottom (24) of the bottle (20), characterized in that the grip region (14) of the bottle (20) comprises said circumferential shoulder (21).

6. A tray as claimed in claim 1, adapted to accommodate bottles (30) which have a circumferential, outwardly extending flange (31) at the top (33) or bottom (34) of the bottle (30), characterized in that the grip region (14) of the bottle (30) comprises said circumferential, outwardly extending flange (31). /

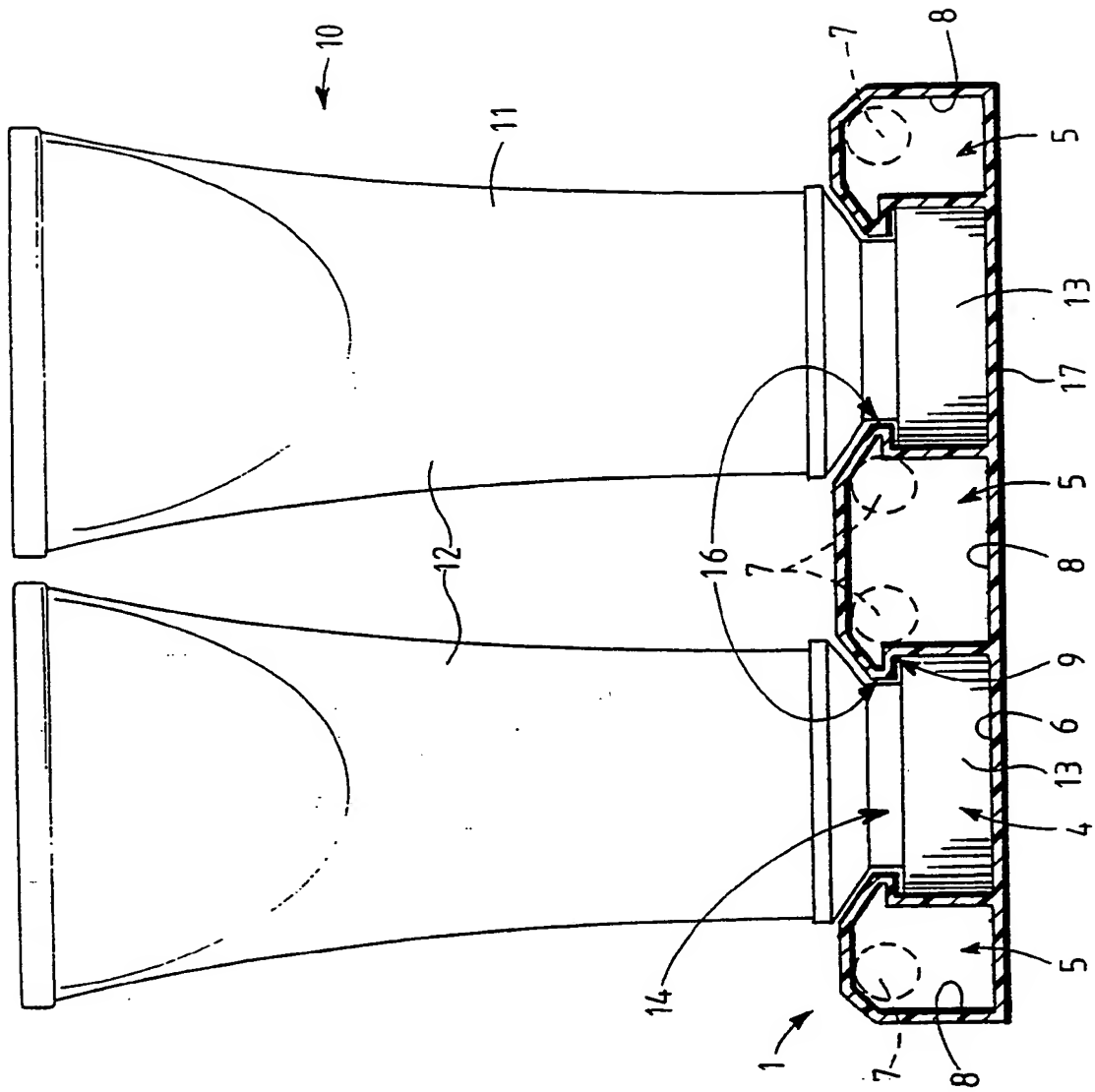
1/5

Fig.1



2/5

Fig. 2



3/5

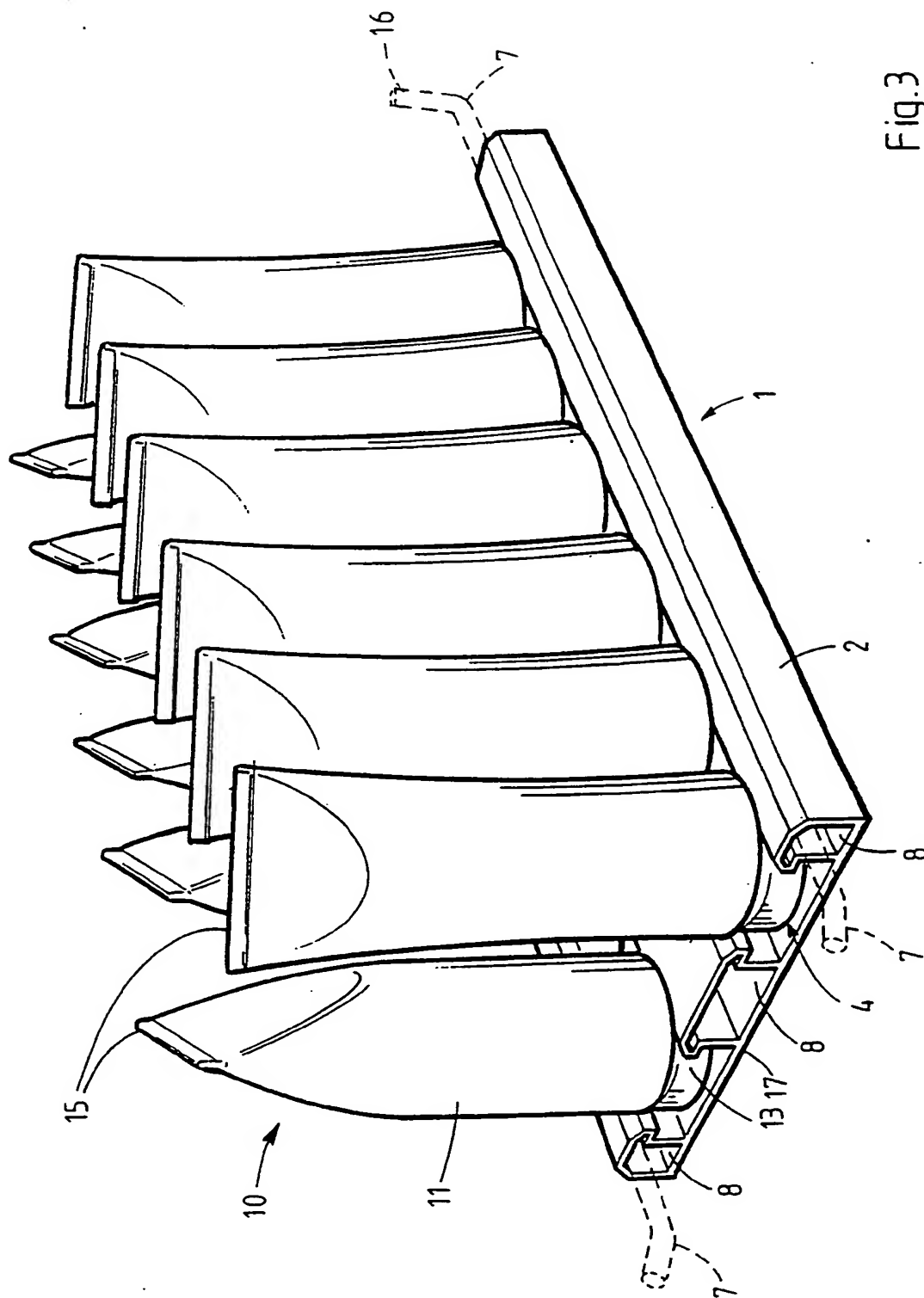


Fig. 3

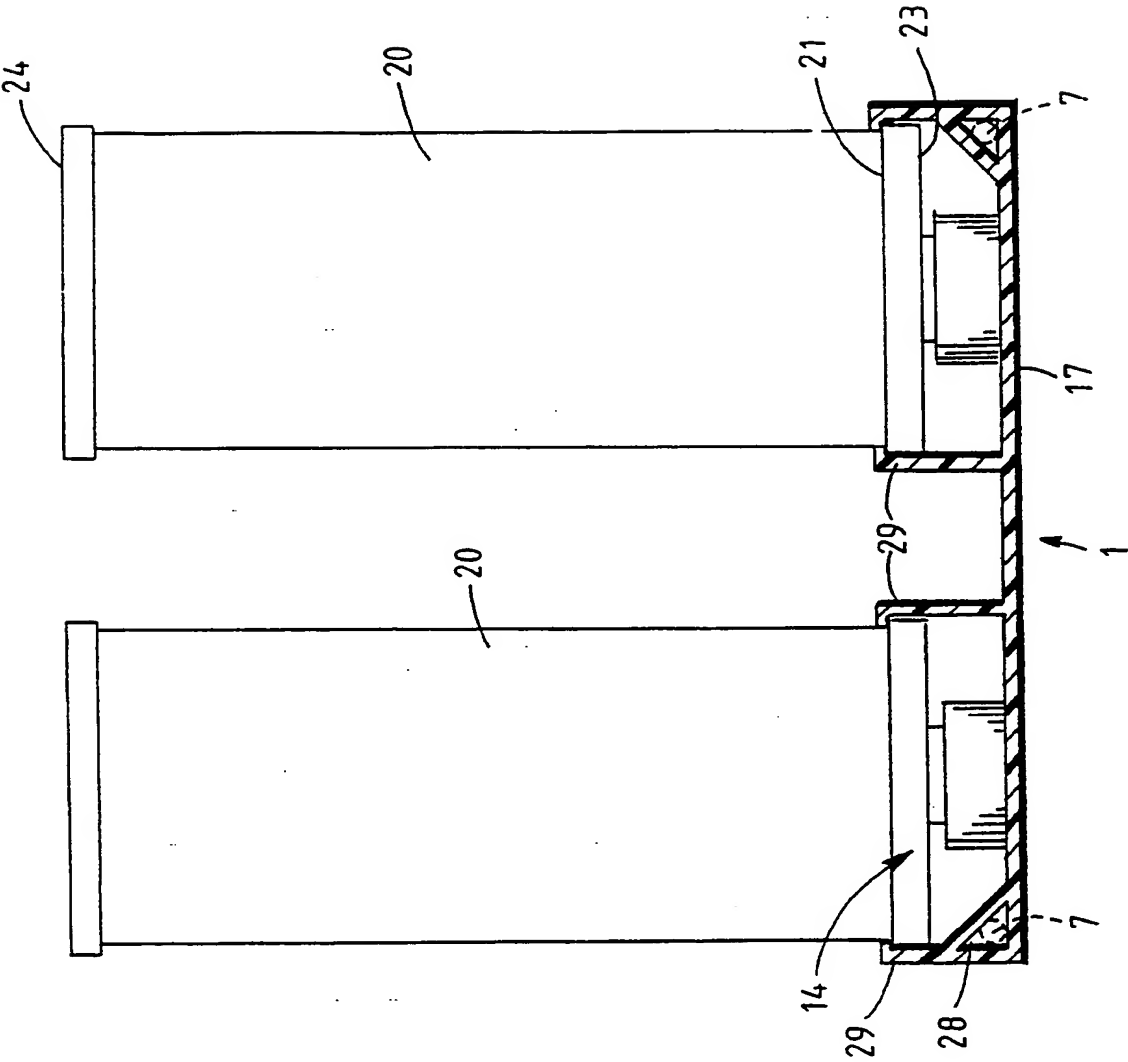
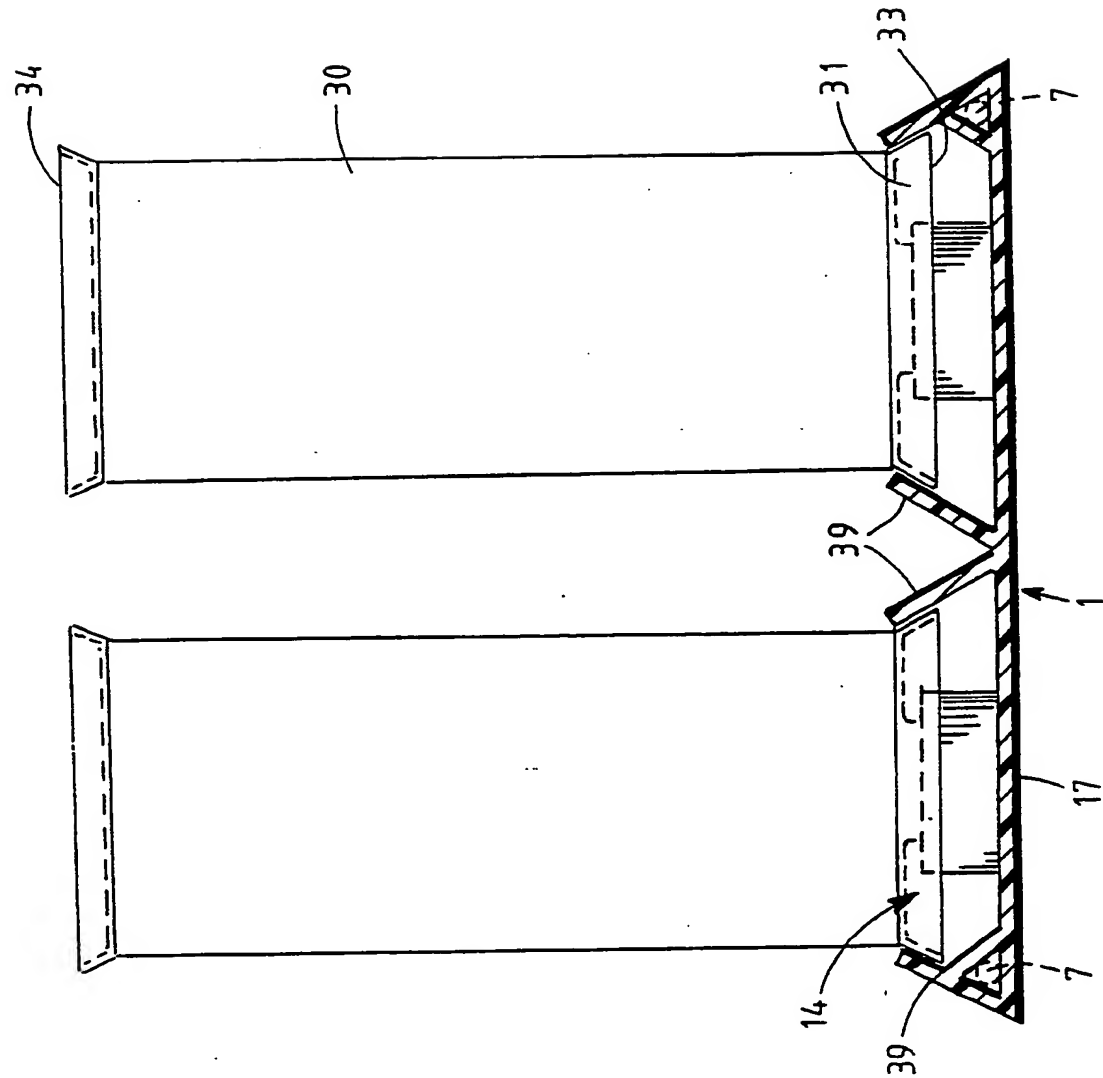


Fig.4

Fig.5



# INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 92/00420

<b>I. CLASSIFICATION F SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup> According to International Patent Classification (IPC) or to both National Classification and IPC IPC5: B 65 D 71/00, B 65 D 85/62														
<b>II. FIELDS SEARCHED</b> <div style="text-align: center; border: 1px solid black; padding: 2px;">Minimum Documentation Searched<sup>7</sup></div> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%; border: 1px solid black; padding: 2px;">Classification System</th> <th style="border: 1px solid black; padding: 2px;">Classification Symbols</th> </tr> <tr> <td style="border: 1px solid black; padding: 5px; vertical-align: top;">IPC5</td> <td style="border: 1px solid black; padding: 5px; vertical-align: top;">B 65 D; A 47 F; A 47 K</td> </tr> </table> <div style="text-align: center; border: 1px solid black; padding: 2px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched<sup>8</sup></div> <p style="padding: 5px;">SE,DK,FI,NO classes as above</p>			Classification System	Classification Symbols	IPC5	B 65 D; A 47 F; A 47 K								
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<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; padding: 2px;">Category *</th> <th style="width: 70%; padding: 2px;">Citation of Document,<sup>11</sup> with indication, where appropriate, of the relevant passages<sup>12</sup></th> <th style="width: 20%; padding: 2px;">Relevant to Claim No.<sup>13</sup></th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">FR, A, 2220147 (L'ORÉAL) 27 September 1974, see the whole document --</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1-6</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">DK, B, 137178 (GUNNAR THURE ELIASSEN) 30 January 1978, see the whole document --</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1-6</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">US, A, 795510 (A.W.HOFF) 25 July 1905, see the whole document -- -----</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1-6</td> </tr> </tbody> </table>			Category *	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>	A	FR, A, 2220147 (L'ORÉAL) 27 September 1974, see the whole document --	1-6	A	DK, B, 137178 (GUNNAR THURE ELIASSEN) 30 January 1978, see the whole document --	1-6	A	US, A, 795510 (A.W.HOFF) 25 July 1905, see the whole document -- -----	1-6
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<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><b>* Special categories of cited documents:<sup>10</sup></b></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition, or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 48%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p> </div> </div>														
<b>IV. CERTIFICATION</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border: 1px solid black; padding: 5px;">           Date of the Actual Completion of the International Search   <b>21st October 1992</b> </td> <td style="width: 50%; border: 1px solid black; padding: 5px;">           Date of Mailing of this International Search Report   <b>23 -10- 1992</b> </td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">           International Searching Authority   <div style="text-align: center;"><b>SWEDISH PATENT OFFICE</b></div> </td> <td style="border: 1px solid black; padding: 5px;">           Signature of Authorized Officer   <div style="text-align: center;"> <b>Kerstin Hällgren</b> </div> </td> </tr> </table>			Date of the Actual Completion of the International Search  <b>21st October 1992</b>	Date of Mailing of this International Search Report  <b>23 -10- 1992</b>	International Searching Authority  <div style="text-align: center;"><b>SWEDISH PATENT OFFICE</b></div>	Signature of Authorized Officer  <div style="text-align: center;"> <b>Kerstin Hällgren</b> </div>								
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ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.PCT/SE 92/00420

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.  
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A- 2220147	74-09-27	NONE	
DK-B- 137178	78-01-30	NONE	
US-A- 795510	05-07-25	NONE	

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